



Technology-Enabled Gains at SJW

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San Jose Water

- Drinking water utility (investor-owned)
- Established in 1866, serves approximately one million people in San Jose metro area
- 230,000 customer accounts (90% residential/10% commercial)
- 2,400 miles of pipe + pumping, storage, water treatment infrastructure



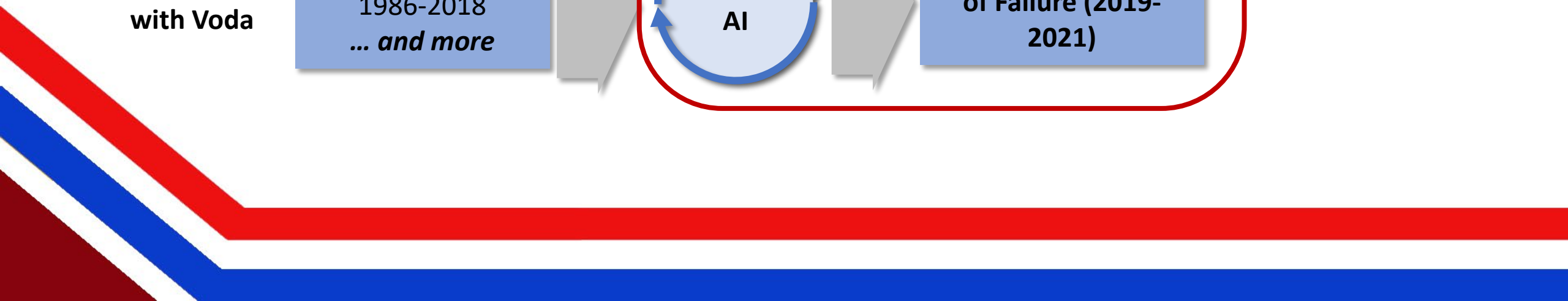
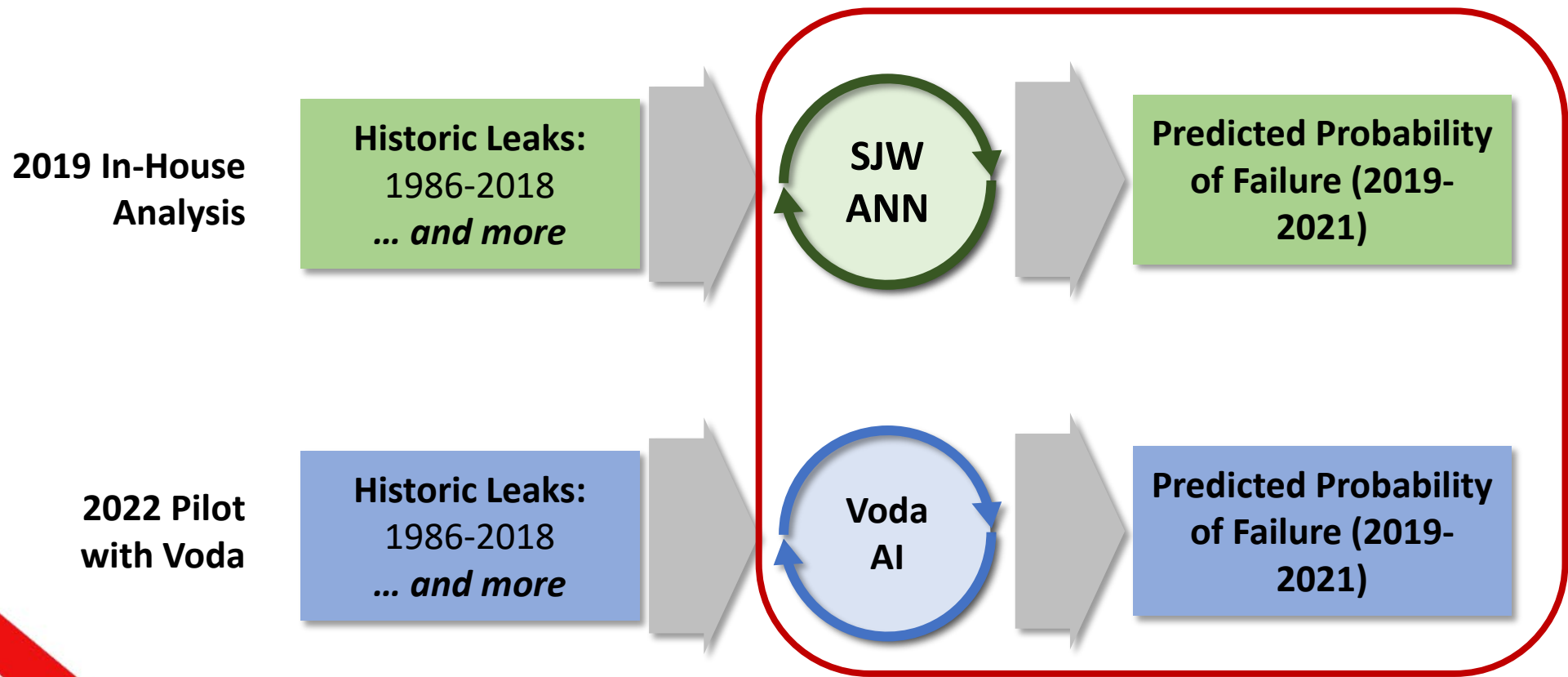


Better Predictions with Technology

- Risk analysis every 3 years to target highest risk pipes for replacement
- In 2022, opportunity arose to consider enhancements in predicting pipeline PoF
- Options:
 1. Use in-house AI model from 2019 (Matlab)
 2. Build a new in-house AI model (Python)
 3. Leverage third party services

Selected a final vendor (Voda®) to compare performance against in-house AI from 2019

Comparison

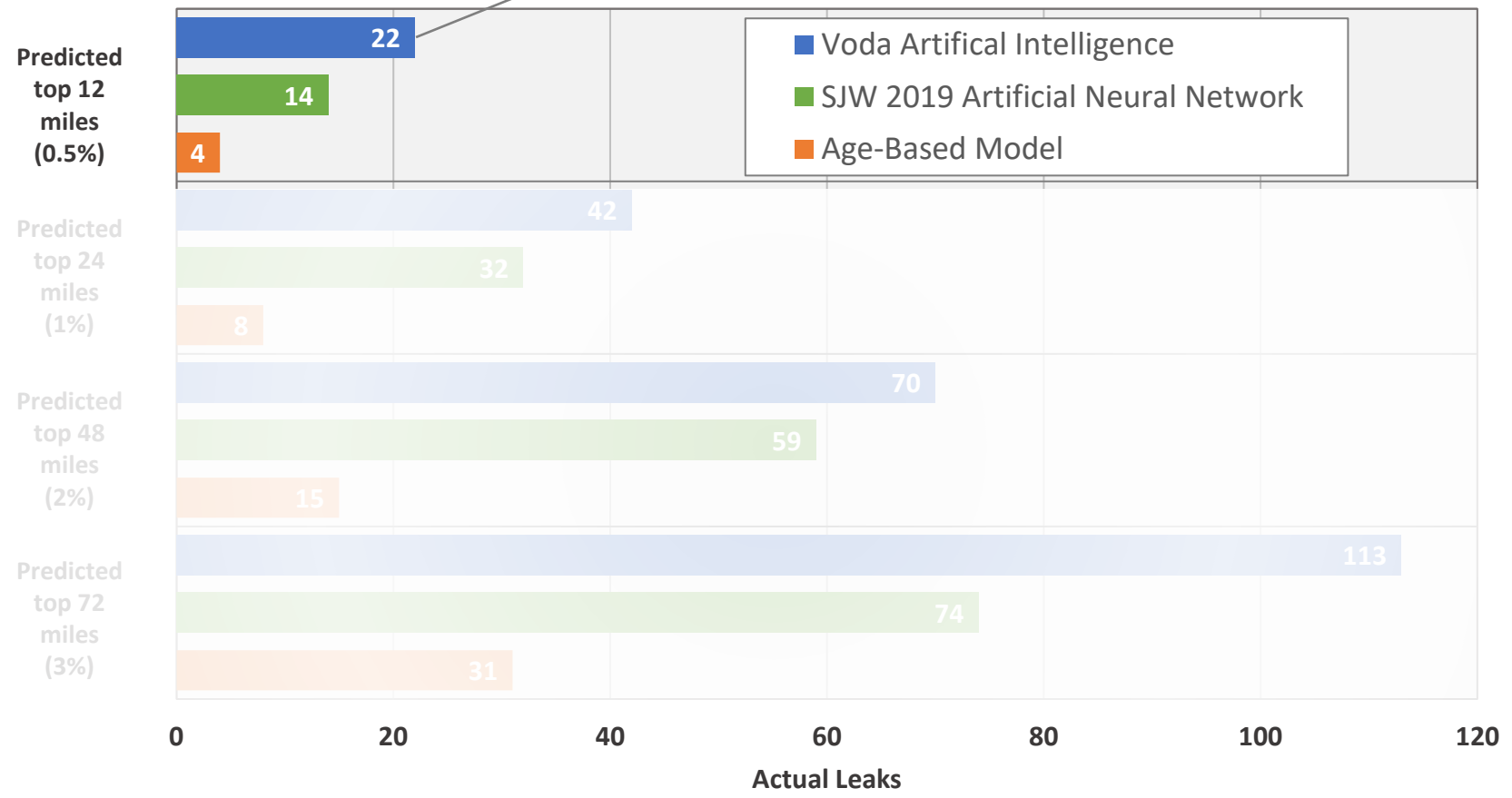




Comparison

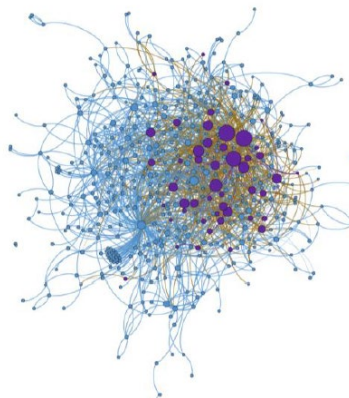


22 leaks occurred on 12 miles (0.5%) of pipes with the highest 3-year PoF per Voda's model.



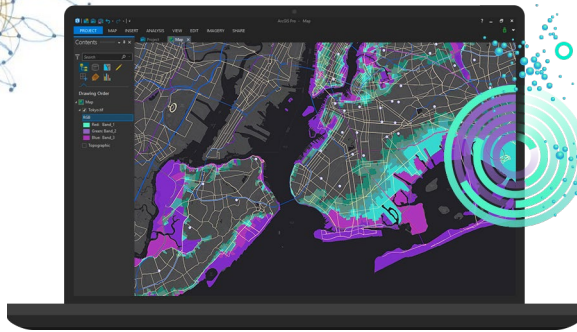


The Information Pipeline



Artificial Intelligence

Geospatial Analyses & Hydraulic Modeling



Top 1% of pipes ranked by BRE

Pipes Being Displayed: 1 - 99

> Pipe ID: 6337	1
> Pipe ID: 6118	2
> Pipe ID: 6053	3
> Pipe ID: 5996	4
	5
	6
	7
	8
	9
> Pipe ID: 5627	10



Risk Matrix



Pipeline Replacement Projects

Risk Analysis

Pipeline Replacement Ranking

Actionable Capital, O&M Strategies



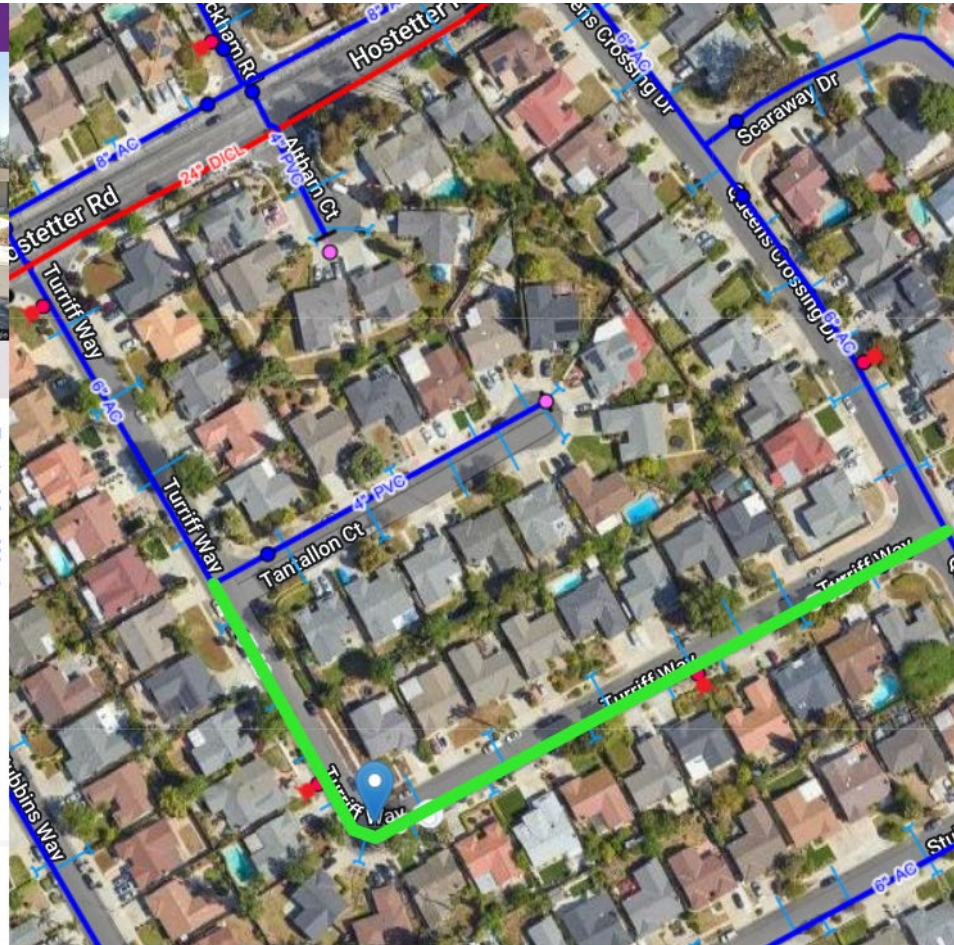
Better Planning with Technology



Water Main ID : 119547
Work Order Number : [A2-269](#)
Diameter : 6 "
Material : AC
Is Restrained : No
Is Tie In : No
Pressure Zone Name : Upper Northwood Zone
Install Year : 1972
Critical Remark :
Plat Map Number : [1126](#)
Remark :

Pipe Replacement Ranking
414 of 49,255 to be replaced

Potable Water

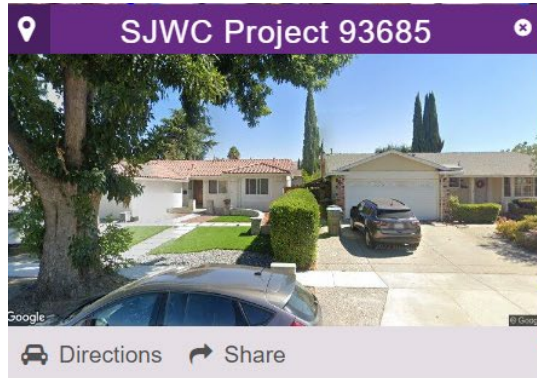


Leak History ID : C293159
Age Range : Older than 5 Years
Service Request Number : C293159
Wam Work Order Number : 1505238
Water Main ID : 119547
Work Order Number : [A2-269](#)
Material : Asbestos Cement
Diameter : 6 "
Pressure Zone Name : Columbine Zone
Service Order Date : Aug 4, 2015
Service Order Close Date : Aug 7, 2015
Cause Of Leak : Contact Root





Better Planning with Technology

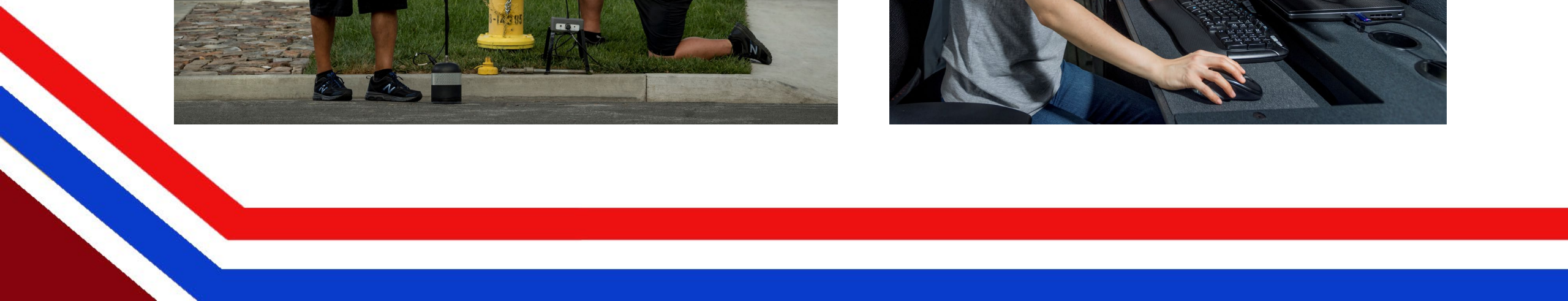


SJWC Project ID : 93685
Type Of Project : Pipelines
Project Number : 6223
Type Of Number : Index
Description : Replace 1,540' of 6" AC and 4" PVC with 4" and 6" DICLZ pipe on Turriff Way, from Hostetter Rd. to Queens Crossing Dr., and on Tantallon Ct., from Turriff Way to End. (1972)
Work Order Number : J3-244
Cost Order Number :
Budget Year : 2023
Project Manager : Jesse Hawkins
Phone Number : 408-279-7816
Email Address : jesse.hawkins@sjwater.com
Contractor Name : Lewis & Tibbitts, Inc.
Status : Proposed
Remark :





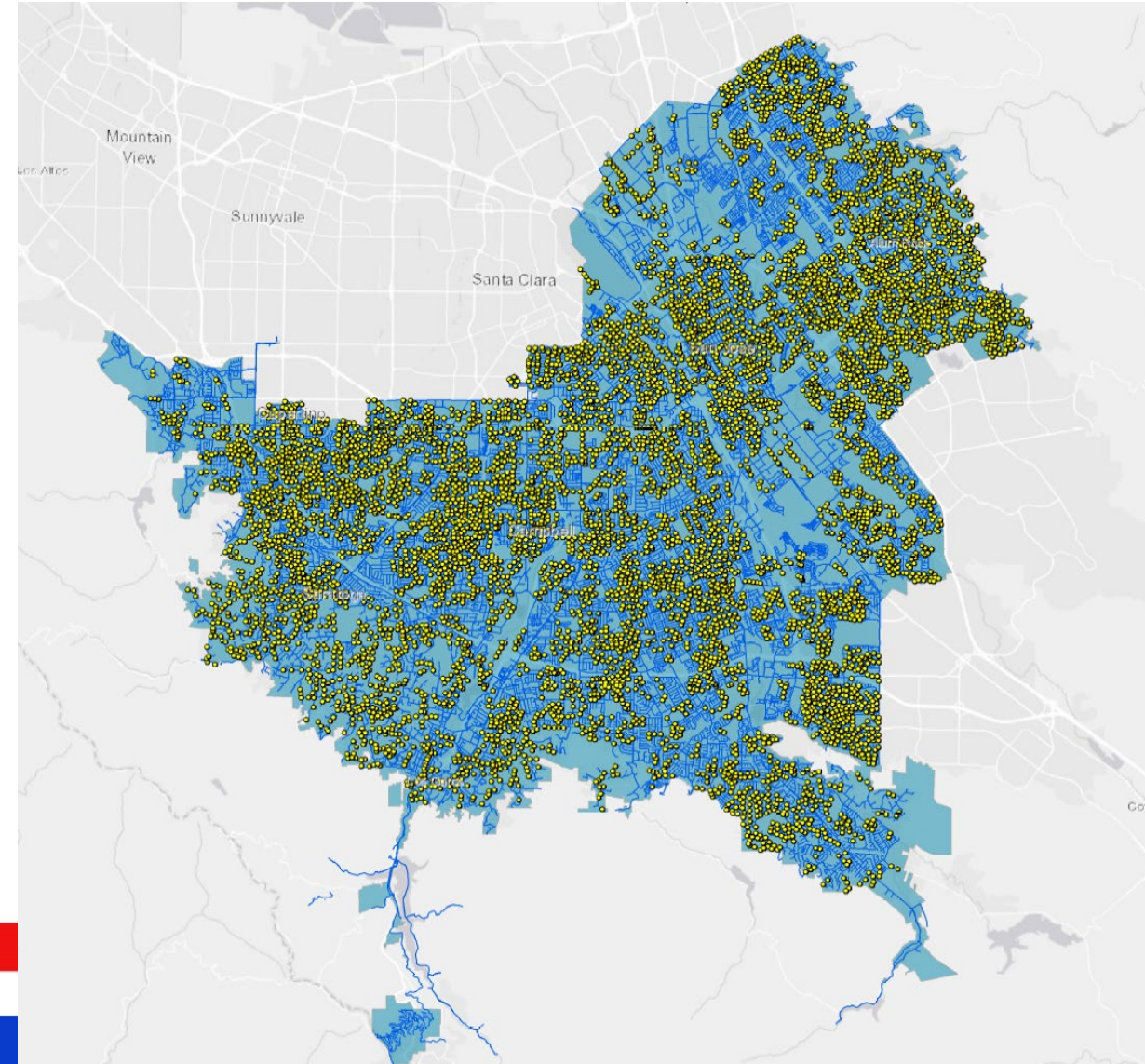
Acoustic Leak Detection





Deployment Locations

- 13,000 sensors deployed in SJW service area
- Deployment locations based on pipeline probability of failure





More Pilots



Operating Parameters EchoShore-DX

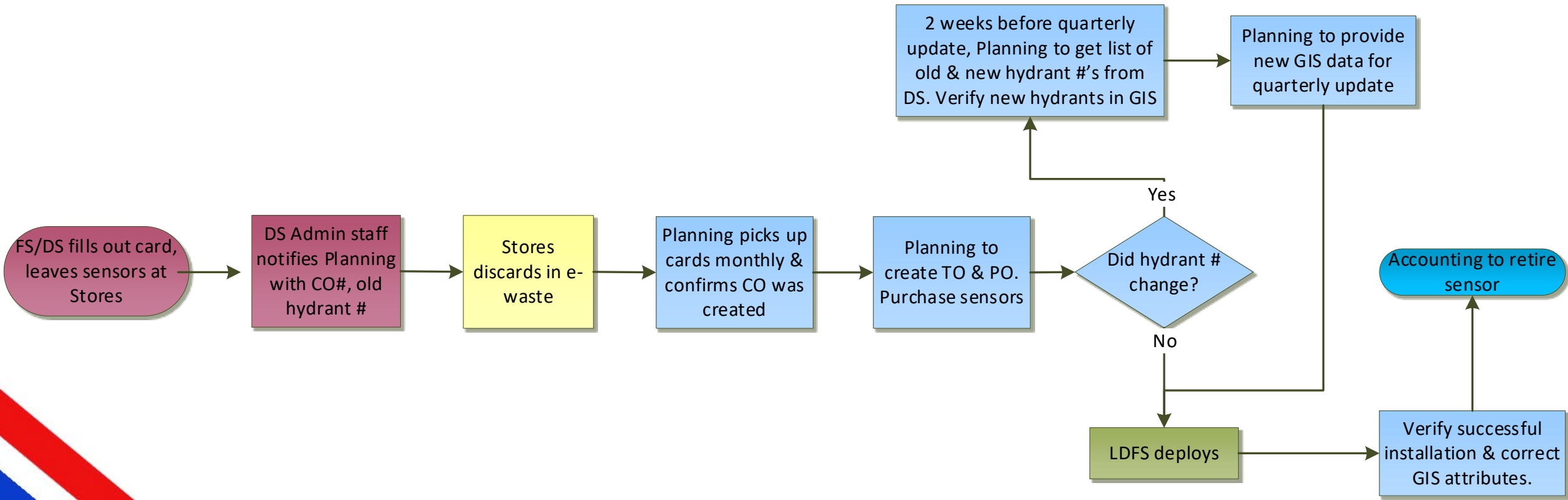
Maximum Spacing	1,500-feet
Pipe Diameter	Up to 12-inches
Pipe Material	All materials*
System	Wet or dry barrel
Compatibility	hydrants
Battery Life	5-years
Mobility	Allows for lift & shift
Managed Service	Yes

*SJW is not monitoring PVC pipe segments





Workflow Considerations





Design for Your Users

- SJW has two full-time field employees and one full-time office employee for leak detection
- Partnering consultant has 2 full-time analysts to monitor SJW's system
- Backup equipment
- Vehicle needs





Ongoing Improvements

Start Date: End Date: Metric Selection for Trending Charts: Leak Count: Date Interval: Moving Avg: # of Days:

DATE PERIOD: JANUARY 15, 2023 - FEBRUARY 15, 2023

41 Investigations

71% Classification Performance (investigations where a leak was found) **3** investigations active & pending

10 San Jose Water Leaks	17 Customer Leaks	11 No Leak Found
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Investigations Historical Trend - Leak Moving Average

Environmental Impact

33.6 Million Gallons of Water Saved

Main	2.6 MG
Service	4.2 MG
Customer	26.8 MG

Equivalent to... **15,013 kg** CO2e Saved

OR **3.3** Cars' Annual Emissions OR **715** Trees



Thank you!

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